



Model 892 Shim Amplifier

The Model 892 Shim Amplifier is capable of dealing with the challenge brought by fast MRI imaging: maintaining a constant shim current in the presence of extremely strong gradient pulses.

The Shim Amplifier is based on high-gain, dual stage current amplifiers with linear output stages, capable of high-current DC drive and high-bandwidth AC compliance controlling the injection of energy into the RT shim system.

The Shim Amplifier is self-contained and includes three-phase AC to DC power supplies with integrated forced air cooling. An intelligent interface featuring RS-232 control, 16-bit, optically isolated digital-to-analog converters, current monitoring, and safety diagnostic circuitry are included. Other interface protocols are also available.

Main features

- Effective management of coupling between shims and gradients
- Stable low noise current drive up to 600W
- Pulsed output up to 1 kW
- Customizable drive of 2nd, 3rd and 4th order shims
- Injected energy dissipation
- High modularity for simple serviceability
- Air-cooled

Applications

- EPI, cardiac, fast imaging
- Advanced MRI imaging and localized spectroscopy
- Ultra-high field magnets (3T and higher)
- Asymmetric gradients, short magnets
- Real time on-slice shimming

Featuring

Coupling between shim and gradient coils causes injection of high bandwidth current pulses into the shim coils, resulting in a time-dependent de-shimming of the magnet, thus generating reconstruction artifacts.

The intensity and complexity of the coupling mechanisms are particularly strong in high-performance gradient coils such as those used for cardiac imaging, 3T and higher field magnets, asymmetric gradients and short magnets.

- **From 1 to 18 shim channels**

The MXH shim power supplies can be customized to match a given magnet shimming requirement, with up to 18 channels of 2nd, 3rd and 4th order shims.

- **RS232, CANBus, IEEE-488 and proprietary protocols**

The MXH shim power supply can be configured with the RS-232, IEEE-488, CANBus, and CANOpen and customized communication protocols.

- **Self and remote diagnostics Simple Serviceability**

The MXH system has a modular design, so that in the event of a failure any faulty module can be easily and quickly replaced with minimum down time of the MRI system. The built-in self-diagnostics features provide for simple and straightforward technical services.

- **Turnkey Installation and Integration**

The MXH systems are designed for a turnkey installation and integration with the other MRI sub-assemblies at the customer's site. The systems are self-contained, thus minimizing external connections and cables. Thorough testing and burning in insure proper functioning, while standard sizes provide a simple and quick installation.

Specifications

10A High bandwidth Shim Amplifiers	
Digitally controlled current sources	5 or 6 channels per 9U enclosure
Maximum F.S. current	± 10 A
Cumulative current output capacity	± 45 A per rail
Voltage	± 95 V
Full power bandwidth	35 kHz (load dependent)
Safety interlock	OPTO-Isolated or contact closure
Load resistance	0.5 to 6 ohms
Load inductance	0 to 20 mH
Load capacitance to ground	100 nF
Thermal stability	± 15 ppm FSR/degree (15-min. warm-up)
Temporal stability	± 25 ppm/day, at constant temperature
Noise	0.1 Hz to 10 Hz below 25 ppm (p-p)
Hum	50/60 Hz less than 50 ppm (rms)
Operating temperature	0 to 35 degrees Celsius
Output	AMP #23 37 pin
Display of current	3 ½ digit DPM (optional)
Control	RS-232 D-SUB 9M
Digital resolution	15 bits + sign
Monotonicity	13 bits
Gain linearity	0.2%
External input	± 5 V bipolar, differential
Analog inputs	D-SUB-50 or BNC
Size (5 or 6 channels)	9U
Shipping weight	70 kg; ~ 150 lbs